JPRS 75299

13 March 1980

East Europe Report

SCIENTIFIC AFFAIRS

No. 664

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available from Bell & Howell, Old Mansfield Road, Wooster, Ohio 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 75299

13 March 1980

EAST EUROPE REPORT

SCIENTIFIC AFFAIRS

No. 664

CONTENTS PAGE

INTERNATIONAL AFFAIRS

Developments in Space Flight Hypnosis Outlined
(NOWOSCI DNIA POLSKA, 6 Jan 80) 1

BULGARIA

Discussion on State of Biological Science
(NOVO VREME, various dates) 2

CZECHOSLOVAKIA

Briefs
[illegible] Achievements 95

GERMAN DEMOCRATIC REPUBLIC

Production of Industrial Radioactive Isotopes Described
(H. Rothe, H. Greupner; STANDARDISIERUNG UND QUALITÄT, Jan 80) 96

HUNGARY

Factory Struggles With MS-1022, Bulgarian Disc Packs, Air Conditioning
(SZAMITASTECHNIKA, Jan 80) 101

Briefs
Juvenile Hormone, Pheromone Experiments 102
New Plant Protective Agents 102

[illegible] (Continued) [illegible]

POLAND

Briefs
New Titanium Recovery Method 103

ROMANIA

Localized Pollution Alert Computer Network Foreseen
(Vladimir George, Piatra Neamt; REVISTA [illegible], 9 Nov 79) 104

DEVELOPMENTS IN SPACE FLIGHT HYPNOSIS OUTLINED

Warsaw SERVITALIA POLSKA in Polish No 1, 6 Jan 80 p 7

[Excerpts] Experiments for the application of hypnosis as a major methodological instrument in research on the psychophysiological states of a human being were initiated in the Soviet Union in 1955 with the use of parachutists. The method of hypnotic blocking of reactions in research on the causes of air disasters has been applied in the U.S. since 1964. In addition to hypnotic modeling of gravitational phenomena in short-duration space flights, scientists quickly developed methods of modeling long-duration flights. They began to consider numerous flight factors and comparison studies and measurements conducted in space-cabin simulators. "Flights" in hypnotic states of weightlessness lasted (for example in the USSR) 3, 5 and 10 days. All mental and physical activities (control, telegraph communications, etc.) conducted by the cosmonauts on board the craft were studied. Errors were recorded by a computer. On orders from outside the craft, the participants in the experiment sensed either a reduction of body mass of up to 5 or 6 kg or an increase of body mass (before the "return" to earth). It is characteristic that "wide-spread tremors" (as those associated with a fever) occur during the return hypnotic increase of body mass. Soviet scientists, after numerous and comprehensive experiments, consider hypnosis to be of importance in the prospects of cosmonautics and continuous operating duties (for example, a 3-day uninterrupted stay by the operator in his seat during an experiment with hypnotic gravitation did not produce any complaints against the discomfort) and to be a substitute (without side effects) for certain medicines. Soviet experiments (1974) indicated complete mental and physical efficiency in the hypo-stimulated operator during a 2-day period. Hypo-stimulation lasts from 5 to 7 minutes and may also be relayed by radio or from a special magnetic-tape recording. In the opinion of Soviet scientists, hypnosis may be of considerable importance in developing a sense of body mass during long-duration space flights, and also pharmaco-hypnosis, in facilitating the metabolism of cosmonauts.

CSO: 2602

DISCUSSION ON STATE OF BIOLOGICAL SCIENCE

Sofia NOVO VREME in Bulgarian No 6, 7, 9, 11, Jun, Jul, Sep, Nov 79

[NOVO VREME discussion: "Topical Problems of Biology and Their Philosophical Interpretation"]

[No 6, Jun 79, pp 99-114]

[Text] The strategic trends in the development of Bulgarian science were profoundly discussed at the July 1978 BCP Central Committee Plenum. Defining biology as one of these directions, the plenum earmarked a number of measures leading to profound changes in the work on the scientific front in our country.

Guided by the plenum's decisions, on 28 November 1978 and 23 January 1979 the NOVO VREME editors sponsored a meeting-discussion on the topic of "Topical Problems of Biology and Their Philosophical Interpretation." The discussion covered the condition of the science of biology in Bulgaria in the light of the basic accomplishments in the development of the global biological sciences and their significance in terms of theory and practice. Great attention was paid to the role of Marxist-Leninist philosophy in the clarification of central philosophical problems of modern biology.

The following participated in the discussion: Academician Kiril Bratanov, director of the BAN [Bulgarian Academy of Sciences] United Biology Center; Corresponding Member Rumen Tsanev, director of the BAN Institute of Molecular Biology; Prof Georgi Konstantinov, dean of the Biology Department, Sofia University; Prof Kiril Vasilev, chairman of the Chair of Dialectical and Historical Materialism,

Philosophy Department, Sofia University; Prof Asen A. Khadzhiolov, deputy director of the Institute of Molecular Biology; Corresponding Member Alexsey Shvindlov, chairman of the Chair of Physical Chemistry, Chemistry Department, Sofia University; Corresponding Member Kaicho Markov, head of the Gene Engineering Section, Institute of Molecular Biology; Profs Grozdan Vasilev, Ivan Kolarov, Todor Nikolov, and Vladimir Tsonev, and Scientific Associates Georgi Markov, Belcho Belchev, Nikolay Nikolaev, Ala Kardashneva, and Atanas Damailov.

The discussion was moderated by Corresponding Member Nikolay Iribadzhakov, editor in chief of the periodical.

A number of controversial problems arose in the course of the discussion and a variety of views were expressed.

The NOVO VREME periodical editors hoped that the publication, with minor abridgements, of the materials of the discussion will contribute to the ever better clarification of the topical problems of biology and the further development of biological and philosophical thinking in our country.

Kiril Bratanov. Strategic Tasks of Biology

Allow me, first of all, to congratulate the NOVO VREME editors for their exceptionally timely and very useful initiative of organizing a profound discussion of the topical problems of biology and their philosophical interpretation.

My topic will be the strategic tasks of the science of biology in Bulgaria. These tasks have been defined, in their most general lines, in a number of BCP documents issued in recent years. The National Party Conference raised the question of improving the organization of labor in all fields of material and spiritual culture, including science and, naturally, biology. The July 1978 BCP Central Committee Plenum took the science of biology away from the marginal and static position it had held on the scientific front and defined it as a strategic dynamic direction, a strategic science with very responsible assignments. The plenum justifiably indicated that our biology is lagging behind the levels achieved on a global scale.

Taking into consideration the fact that, throughout the world, biology is in a process of tempestuous development and that revolutionary changes are occurring within biology, we cannot fail to see how topical a discussion of problems of biology and their philosophical interpretation is.

What are the strategic tasks of biology in Bulgaria?

The first strategic task is the study and practical solution of basic theoretical problems of modern biology. This includes the following:

First, the problem of protein, considered in terms of two aspects. The first aspect is the study of protein as a basic component of animate matter, as the main structural material in the ladder of the organic world. The second aspect is the development and mastering of methods for the synthesizing of protein. It is a question of a microbial protein, vegetal protein, animal protein, or, in general, protein and its numerous components which are today in extremely short supply and which are a necessary raw material for the nutrition of humans and animals.

The protein problem was defined by the July BCP Central Committee Plenum as exceptionally important. It is equally important on an international scale. According to the UNO, the daily physiological ration averages 100 grams of protein per person; yet, production does not exceed 58 grams; 38 percent of the population on earth is hungry and 60 percent is protein hungry. Consequently, this acute protein crisis calls for the profound study and mastery of processes and methods for the biosynthesis of protein and its components. Let us particularly stress that it is a question not only of the study but the mastering of such processes, their utilization to meet human requirements, and the development of industrial methods for increasing protein production. The study of protein and its components faces all links within the system of the BAN Unified Center for Biology. That is why all units are studying the processes of animate matter in which protein and its components play a basic role in the multiplication and transmittal of hereditary data, the growth, development, reactions, and immunity in the formation of antibodies and the reception of the environmental signals, regeneration, and so on. Today this problem becomes particularly urgent in mastering the biosynthesis of microorganisms for the production of microbial protein, mastering and intensifying plant biosynthesis, obtaining plant protein and, consequently, increasing plant protein yields. It becomes even urgent in the case of the biosynthesis of animal protein so that we may upgrade its output and increase the output of meat, milk, eggs, and other products, for animal protein offers a number of physiological advantages.

That is why all units along our biological front must make a profound study of the protein problem. They must study the mechanisms for protein biosynthesis, and protein structures, development, and functions. Methods for increasing protein production must be based on the results of such studies.

Second is the problem of the study and control of the basic processes of animate matter--from viruses to man--for the benefit of man. Contemporary studies in this area have made it possible to reach animate

matter down to the level of atoms, molecules, and molecular complexes. A systematic study is underway of the most important material carriers of life processes: proteins, nucleic acids, polysaccharides, lipoproteides, and regulators of processes in the living cell--ferments, hormones, vitamins, and immune bodies. Today processes related to the mechanism of the preservation, transfer, and implementation of genetic information are being interpreted from new positions. Equally new positions have been adopted in explaining immunity, transmission of nervous excitation, transformation of energy in the cell, and the cell's receiving of signals from the outside.

All this enables us to study the mechanisms of life processes not only on the level of atoms and molecular structures but of organoids, on the cellular level, and on the level of entire organisms.

The study of life processes and of their control mechanisms raises a number of important theoretical and applied problems facing all scientific biology units. The discovery of a variety of genetic, biophysical, immune, and other ways and means for controlling life processes is of tremendous significance.

The realm of the second major problem includes studies aimed at discovering and mastering the use of molecular genetic mechanisms of heredity and the means for controlling them. Today certain changes are being achieved in plant and animal heredity through the use of a variety of genetic methods. Gene engineering has been developed on this basis in recent years.

Furthermore, possibilities are being developed for controlling poorly protected processes in animals and man, such as immunogenetic processes, immunity, allergy, and so on. At the same time, possibilities for increasing the protective forces of the body are continuing to rise.

Biology faces the task of joining ever more actively in the study and practical utilization of such possibilities and prospects.

The third basic problem is that of the study and full utilization of the biological resources available to our country, resources which, unfortunately, are not being used at full capacity.

The most advanced biology studies in the world are focused on the theoretical and practical mastering of the most important processes of animate matter. The final objective of such studies is to achieve a fuller utilization of the great biological reserves contained in animate nature. Such reserves consist of microorganisms, yeasts, microalgae, crops, forests, etc. The study of such reserves would enable us to optimally use the genetic stock contained in the animate organisms and determine in full the biological potential for synthesizing, multiplying, raising, developing, and reproducing the biomass, the animate matter.

The USA unified biology center has set up a comprehensive problem work group which drafted a national program for the study and rational utilization of the biological resources in our country. The program includes the topics of the utilization of microbial resources, resources contained in wild plants and cultivated crops, forests, water reservoirs, and other biological sites. By special order of the Council of Ministers the task was set and a group was created to work on the preservation, cultivation, and rational utilization of medicinal and healing plants in which our country is rich. The task was also set to ensure the full utilization of the biological resources of wild and domestic animals, the study of pests and parasites attacking animal organisms and plants, and the development of effective methods for combating them. Another important task is upgrading the productivity of forests, natural pasture grounds, water reservoirs, game and fish preserves, and the preservation of plankton and life in rivers, lakes, and dams in some of which, unfortunately, it has become extinct.

The fourth major problem is the study and utilization of the biological factors for the preservation and cleaning of the environment. The purpose is to reach a natural condition of the air, water, soil, and forests and, in general, of the environment, eliminating the harmful consequences of human activities and, particularly, of industrialization, which endangers the country's genetic stock. Scientific developments in this area and their implementation will preserve the natural biological balance which is so greatly important to human life.

The fifth major problem is the study of human biology and physiology, with a view to extending man's creative ability to work, the preservation of his health, and the extension of his life span. This problem involves studies related to metabolism, reaction of organisms, regeneration, struggle against cancer and cardiovascular disturbances, premature aging, and a number of diseases defined as diseases caused by contemporary civilization.

The importance of the physiological control of human ability to work and to react is increased under contemporary production conditions. With every passing day physiology and, particularly, neurophysiology, are becoming ever more closely linked with the scientific organization of labor. This calls for broadening physiological studies on the fuller adaptation of the parameters of the technical facilities to human physiological processes. Particularly important in this respect are problems in the field of bioelectronics and biorobotics. However, the problems of biorobotics cannot be resolved at the present stage without the participation of specialists in physiology and biology.

These major theoretical problems do not comprise the entire broad range of exceptionally important problems of modern biology. However, they are of exceptional importance, of basic significance to the solution of

[illegible]

[illegible]

[illegible] [illegible] [illegible] [

49. [illegible]. No 6, 1970, p 41.

50. [illegible], No 6, 1970, p 40.

51. [illegible], p 109.

52. [illegible]. No 9, 1970, p 91.

53. Peter Lewis, "Biological Machines: A Cybernetic Approach to Life," [illegible] Amsterdam, 1970, p 13.

54. [illegible], p 14.

55. [illegible], No 6, 1970, p 40.

56. I. Watson, "Mutualitarian Biological Laws" [Mutualistic Biology of the Gene], Mir, Moscow, 1970, p 50

57. V. I. Lenin, "Marx," [Works], Vol 30, pp 90-91.

58. [illegible], Vol 30, p 90.

59. [illegible]

60. [illegible], No 6, 1970, p 106.

61. [illegible], No 6, 1970, pp 106-[illegible].

62. V. Siggins, Op cit, p 291.

63. [illegible], p 1[illegible].

64. [illegible], p 251.

65. [illegible], pp 258-259.

66. [illegible], p 2[illegible].

67. [illegible], p 2[illegible].

68. [illegible], p 258.

69. [illegible], p 259.

70. [illegible], p 2[illegible].

71. [illegible].

53. [illegible] Bogorin, op. cit., p. 184.

54. Ibid., p. 194.

55. Ibid., pp. 215-220.

56. Ibid., p. 198.

57. [illegible], No. 6, 1970, pp. 114.

58. Ibid., pp. 110-111.

59. Ibid., p. 111.

60. F. Bogorin, "Zero-Gravity," Ind. and ESP, 1970., p. 31.

61. A. Mara and F. Bogorin, "Current Psychedelic Behavioral Therapy," Vol. 11, Ind. and ESP, 1970, p. 214.

62. F. Bogorin, "Zero-Gravity," p. 34.

63. C. L. Lemon, "Book," Vol. 18., p. 111.

64. C. L. Lemon, "Mara, Bogorin, Marasco," Mara, Bogorin, Marasco, Parrender, 1971, p. 115.

65. F. Bogorin, "Zero-Gravity," p. 11.

66. C. A. Bogor, "Philosophical Processes Levels-Human Biology," Philosophical Problems of Theoretical Biology, Vol., Moscow, 1970, p. 5.

BRIEFS

SCIENCE ACADEMY MEETING--The chairman of the Czechoslovak Academy of Sciences (CSAV) Academician J. KOZESNIK stressed at the 30th General Meeting of CSAV that advancement in science and technology is the only possible alternative for successful development of economy in the CSSR. Some of the achievements of the current five-year plan cited were the new manufacturing process of bearing rings from austenitic steels, development of the field emission raster electron microscope and of the laser interferometer. The effective use of waste blood from slaughtered animals in the manufacture of antigens has effected savings of 124 million Kcs per year. [Prague PRACE in Czech 21 Feb 80 p 1]

CSO: 2402

[redacted] DEMOCRATIC REPUBLIC

PRODUCTION OF INDUSTRIAL RADIOACTIVE ISOTOPES DESCRIBED

East Berlin [redacted] QUALITAET in German No 1, Jan 80 signed to press 27 Nov 79 pp 22-24

[Article by Dr G. Bothe and Dr. H. Creupner, Office for Standardization, Measurements and Quality Control: "Preparation of Radioactive Standard Probes--Contribution Toward Effective Application of Radioactive Isotopes in the Economy"]

[Text] The acceleration of scientific and technical progress as a main avenue for intensifying production, in the sense of continuous fulfillment of the main task, requires the use and continuous development of the most modern methods and technologies. In this class belongs the broad application of radioactive isotopes (radio nuclides) in the economy.

Of the many applications of radioactive isotopes in industry and research, only a few are listed here.

--Determination of particle-movement parameters in the design of industrial equipment, for example in the materials-chemistry industry.

--Investigations of melting behavior and distribution of alloying elements, for instance in steel.

--Investigations of material transport processes with radioactive tracers in potash refineries.

--Experiments related to activation analysis in such areas as the mining, smelting and semiconductor industries, agriculture and biology.

--Autoradiographic methods in microelectronics, metallurgy, biology and many areas of research.

In most cases it is necessary to accurately control the application of radioactive isotopes through measurement of their activity.

The GDR is assuming an important place among the CEMA countries in the production of radioactive isotopes. Next to the USSR, it is the second largest producer of isotopes among the CEMA countries and within this community is responsible for a comprehensive offer of specialized products. As a result of the reconstruction of the technology center in the Central Institute for Nuclear Research at Rossendorf, the production of isotope products will increase threefold by [illegible].

One of the most important specifications relating to radiation sources and nuclear medicines is their activity value. From the manufacturers of isotopes, the determination of activity values with an accuracy of [illegible] to [illegible] percent is required.

In health care of the people, nuclear medical methods are taking on increasing importance for both therapy and diagnostics. Today, about [illegible],000 patients per year are treated with nuclear medicines in the GDR. With these methods, examinations which were previously done with X-rays can now be accomplished with a significantly lower radiation exposure of the patient. In addition, completely new possibilities for portraying the organs have arisen. With radionuclides, not only topographic investigations are possible, but also the diagnosis of functions in the human body and in individual organs can be accomplished. In various areas of cancer therapy, radiation can be accurately focused on the tumor, almost completely sparing the healthy tissue.

Also, for achieving optimal results and for eliminating undesirable side effects in nuclear medicine, accurate control of the applied activity of radionuclides is of extreme importance. Activity measurements accurate to within [illegible] percent are required.

An important task in the industrial application of radioactive isotopes is monitoring of the professional users of radiation, objects, surfaces and the environment of isotope and nuclear installations for radioactive contamination to insure adherence to the maximum permissible activity concentrations established by the radiation protection statutes.

Activity Measurement Procedures

The execution of this task places numerous requirements on the activity measurements to be carried out with regard to both the measuring methods and the radionuclides to be measured. Similar problems are treated in the regional surveillance of ambient radioactivity.

As already mentioned, the previously listed application examples involve situations in which radioactive nuclides are applied as open radiation sources. These generate specific conditions for measuring their activities. The quantity "activity," defined as the number of nuclear transformations per unit of time in a radioactive radiation source (SI unit: Becquerel, Bq), is not available as a direct measurement. It is measured via the detection of the resulting radiation in the form of energetic particles or quanta.

This deviation is specific for each nuclide. It undergoes on its way from the source, the radioactive radiation source, to the measuring equipment, the detector, numerous interactions with matter, with the result that generally no simple relation exists between the number of nuclear transformations in the radioactive radiation source and the number of particles or quanta registered by the detector. The resulting instrumentation difficulties in quantitatively determining the activity are effectively circumvented by using what are called relative activity measurement methods.

In the case of relative activity measurement methods, one deals with methods wherein the applied activity measuring device is calibrated using standard radiation sources, with the calibration being made under the conditions which will prevail. For the case at hand, examples of such measuring devices are liquid scintillation counters, isotope calibrators with ionization chambers, radiometers, several measuring devices, special gas detectors and well-type counters. They are to some extent offered commercially. Often, however, home-made devices are used so that special conditions associated with the application of radioactive isotopes can be properly accounted for.

Proceeding in this manner assures the uniformity and correctness of activity measurements made in the application of standard radioactive samples. An additional, economically important result is achieved, namely that the user can circumvent the use of the technically more involved, and thus more expensive, absolute-activity measuring method and can use the significantly cheaper relative-activity method.

Preparation of Standard Radioactive Samples

The required standard radiation sources for calibrating activity measuring devices are supplied by the Office for Standardization, Measurement and Commodity Testing (ASMW), and others, in the form of standard radioactive samples. Standard radioactive samples are definite quantities of radioactive solutions or gases sealed in ampules or brought into a suitable solid form whose activity values are measured with high accuracy and which can be confidently used as reference standards. In the preparation of standard samples, a paradigm is followed which provides for, in addition to the absolute activity measurement, also control measurements for such things as the adjustment of the activity-concentration reference value and the determination of radioactive impurities. A detailed description of this scheme is found in [1].

Standard samples in the form of solutions are distributed in sealed medical glass ampules of reference sizes 1 and 5 ml which contain about 1 and 4 grams of solution, respectively. The reference values of the activity concentration are [illegible] MBq/g (formerly 1, 10 and 100 μCi/g). For the distribution of radioactive gases, glass ampules similar to those used commercially for the same purposes are used. The reference values are 10 and 50 ml. The quantity of gas in an ampule is determined by the available starting material. The reference values of the activity concentration are 0.01, or 10 MBq/.

Request for the future in the distribution of standard radioactive samples in the form of solid solution sources, such as are used for water-sample analysis in the radiochemical laboratories of large users of radioactive isotopes.

New radionuclides are being added continuously to the large number already in industrial use today. Because of their special suitability for nuclear medical applications, electron trapping radiators, especially, are increasing in importance. Because of this development, the distribution of standard radioactive samples by the ABMB is being considered.

Presently, the ABMB program embraces standard radioactive samples for a total of 54 nuclides, including the following: α-radiators, Pu 239, Pu 239 β-radiators, H 3, C 14, P 32, S 35, Sr 90 Pm 147, Tl 204, α, $\beta\gamma$ coincident radiators, Ag 109, Ba 133, Cs 60, I 131, Cs 134, Au 198, electron trapping radiators, Mn 54, Fe 55, Co 57, Sn 113, I 125.

A catalog of the prepared standard samples which is available from the ABMB Isotope Radiation Division, 1000 Berlin, Hallerstrasse 16, presents more detailed information. In economically justified cases, the instrumentation potential of the above listed parameters or nuclides will be discussed in detail upon special request of the user.

For measuring activity or the activity concentration of standard samples, a group of absolute-activity measuring set-ups is used which establishes the primary standard (SIR national standard) for the unit of activity. These set-ups are, at the same time, constituents of the CEMA standards on the unit of activity which are certified by the CEMA Standing Commission for Standardization.

For the further development of procedures in the field of absolute-activity measurement technology, a comprehensive set of tasks is performed in the ABMB within the scope of research and development topics whose content is developed in concert with the main users of radioactive isotopes in the GDR.

The required tailoring of the ABMB supply program described above to the needs of the economy is to be viewed as a process subject to continuous development. The advanced determination of certain parameters, nuclides and delivery schedules for standard samples is, on the other hand, indispensable if high effectiveness and timeliness of ABMB's work is to be guaranteed in the face of large volume of requests.

International Cooperation

Inside the CEMA Standing Commission for the Peaceful Use of Atomic Energy (SEV), negotiations are presently being conducted aimed at expanding, with respect to delivery of standard radioactive samples, the specialization agreements for isotope products which have been in existence for several years. The sought regulations should become effective in the perspective

[illegible] Besides its own work in many committees of the [illegible] Standing Commission for Standardization [illegible] to create the necessary prerequisites for the mutual recognition of test results in the area of international conformity evaluation procedures of standard conformity samples. At both levels the ASMW performs comprehensive work. Simultaneously, these and other activities promote acceptance of values measured by ASMW and cooperative effort in the further development of standard measuring equipment at the international level.

References

(1) Bahr, H., Brust, H., Schneider, L.: "Zur Darstellung, Aufbewahrung, Reproduzierbarkeit und Weitergabe der Einheit der Länge." [illegible] 17 (1977) 1, p. 25.

Prof. Dr. [illegible]
Chairman ASMW

[redacted]

FACTORY STRUGGLES WITH ES-1012, BULGARIAN DISK PACK, AIR CONDITIONING

Budapest SZAMITASTECHNIKA in Hungarian Jan 80 p 9

[Text] For a variety of reasons, chiefly involving air-conditioning equipment, assembly of the machine delivered to the Lenin Metallurgical Works began on 21 August and was completed on 30 September. Test operation took place between 19-25 September.

The machine was installed by a six-member brigade working in very extended shifts. During this period a large number of integrated circuits had to be replaced. This was felt to be due to the relatively high ratio of IC to other parts and also to the fact that those who fabricate such equipment "burn" it for a minimum period.

Among concrete problems involving the equipment, the Hungarian disc packs should be mentioned. Although they arrived in their original wrapping, there was much dust in the cartons. The "setting (testing) disc," for example, was so dirty that over one liter of isopropyl alcohol had to be used to clean it. The discs themselves were shorter than we were accustomed to in other computers, so that the edges of discs were visibly damaged in a number of places. During the first two months of operation, the number of breakdowns averaged one to two daily. Chiefly the multiplex peripherals broke down, but there are also contact problems.

Calibration of the heads of the magnetic disc units should be checked every 2 weeks, although their quality is such, according to the installation brigade, that precise setting is impossible.

Three of the magnetic tape units can be used on a regular basis. However, one has been malfunctioning for over a month and proved unreliable from the moment of installation. The computer itself has been running normally since 25 September using the IBM DOS operating system.

Now a few words about the air-conditioning equipment. It was to have been delivered in February 1979 after adjustments had been made. Instead, it arrived on 8 June. There have been innumerable problems involving its installation, and thus it became operational only on 22 November. The other side of the issue is that computer and air-conditioning equipment should be bought and installed simultaneously. This would eliminate the 3-month lag between all could come on line, and possibly it would not take five times as long to make the air-conditioning operational as it does the computer.

CSO 2502

[redacted]

[redacted]

JUVENILE HORMONE PREPARATIONS EXPERIMENTED--For years extensive field tests have been conducted with the insecticides which have a juvenile hormone effect. The agents were developed by the [redacted] Pharmaceutical and Nutriment Pharmochemical Factory. The factory has recently applied for permission to distribute and use them for experimental purposes. One of the agents acts on flies, and mosquitoes, the other, on caterpillars which damage field crop, and forests as well certain trematodes. Since these biregulator preparations are of Hungarian origin, they will probably be put to use in the near future. Work with pheromones began in Hungary in 1966. It was initiated by Tibor Jermy, Academician. In the beginning the Plant Protection and Agrochemical Center of the Ministry of Agriculture and Food as well as the Plant Protection Research Institute investigated the possibility of baiting traps with female Lepidoptera. More recently the Plant Protection Research Institute began studying the structure of pheromones of pests common to Hungary. As a result, hardly four years later pheromone preparations have gone on the market. The time-release pheromone preparations have been used with notable success in fruit orchards. A count of the insects trapped enables growers to determine when orchards should be sprayed. [Budapest MEZOGAZDASAG in Hungarian 11 Feb 80 p 10]

[redacted] PLANT PROTECTIVE AGENTS--The [redacted] Plan Chemical Works has produced a pheromone against insects which sells under the name "Gossyl-LP." In the past agents of similar potency had to be imported from the USA. Another [redacted] product has been developed which is more effective against rodents but does no harm to other animals. This substance can be efficiently spread from aircraft. [Text] [Bonn DIE LANDWIRTSCHAFT DES OSTBLOCKES in German 10 Jan 80 p 6]

[redacted] 2502

[illegible]

[illegible] TITANIUM RECOVERY METHOD--Polish scientist (Docent Stefan Mora) from the [illegible] Politechnical School discovered a new, highly-productive method of obtaining titanium. To date, this metal has been obtained through the reaction occurring under high temperature between titanium ore and powdered aluminum combined with oxidizers. Mora's method, which has already been patented, is considerably more productive. It is possible to obtain 0.6 kg of very pure titanium from 1 kg of ore. Titanium ore (powdered dioxide of this metal) is mixed with powdered magnesium and is exposed to the action of an argon plasma beam or that of another inert gas. The reaction of reduction occurs in the plasma beam. Oxygen is received from the titanium oxide and is acquired by the magnesium. Plasma furnaces were used in this regard. In this method, this reaction could be utilized, because the oxygen compound with magnesium is more stable than the oxygen compound with titanium. The titanium is collected on the furnace bottom. The titanium is received in a liquid state and is formed into ingots, after it is cooled to a temperature of plus 300 degrees. A very pure, finished metal is obtained in this form. The entire reaction occurs in a hermetic chamber of the furnace, because even the slightest amount of air entering the chamber during this process would cause repeated oxidation of the titanium. [Excerpt] [Warsaw POSTEPY [illegible] in Polish No 12, Dec 74 p 57]

[illegible] 2409

[illegible]

[illegible] POLLUTION ALERT CENTER NETWORK PLANNED

[illegible] in Romanian No 4, [illegible] pp 2[illegible]

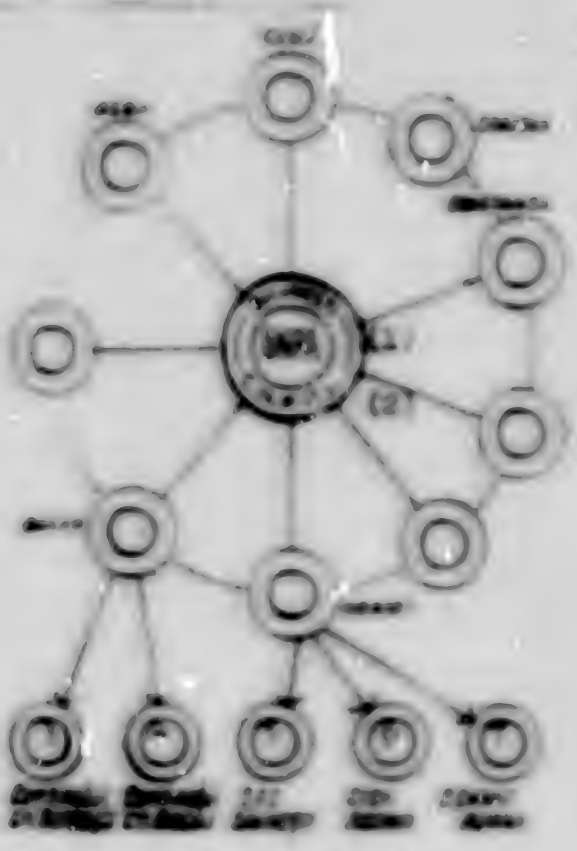
(Article by Vladimir George, Matra Dept "Electronic Computers Serving the Environment")

[Text] The program directives for scientific research and technological development for the period 1981-1985 and the principal orientations up to the year 2000 -- which have discussed publicly -- call for sustained development of industry, constructions, transportation, agriculture and all sectors of activity in accordance with the requirements for protection of the environment, utilizing the newest equipments, technicques and methods of work. Our socialist society places man with his material and spiritual needs in the center of policies for economic development, giving serious importance within this framework to the environment, which is considered an intrinsic component of the strategies for social-economic development.

Protection of the environment has thus become a problem of the state, with the responsibilities in this field stipulated in many legislative acts. The founding of the Inter-ex Council for Protection of the Environment, subordinate to the Council of Ministers, and the development of national research programs concerning pollution demonstrate the importance which is accorded to problems relating to environmental protection.

Under contemporary conditions, development of an integrative rule and coordination in urban agglomerations become powerful and permanent sources of pollution when their inclusion in the general economic circuit is not well correlated. The greater the degree to which we better understand the unity of nature, including the intimate relationships among all of its factors, the easier it will be for us to introduce within this complex of objective phenomena and structures the effects of social activities, using and also seeking to respect a pre-existing law. Because pollution does not respect the "borders" of states and there is [illegible] only a single earth, combination of pollution factors and preservation of balance in the ecological system are the responsibility and the moral obligation of all people, all governments, and world public opinion.

Figure 1. National Computer Network



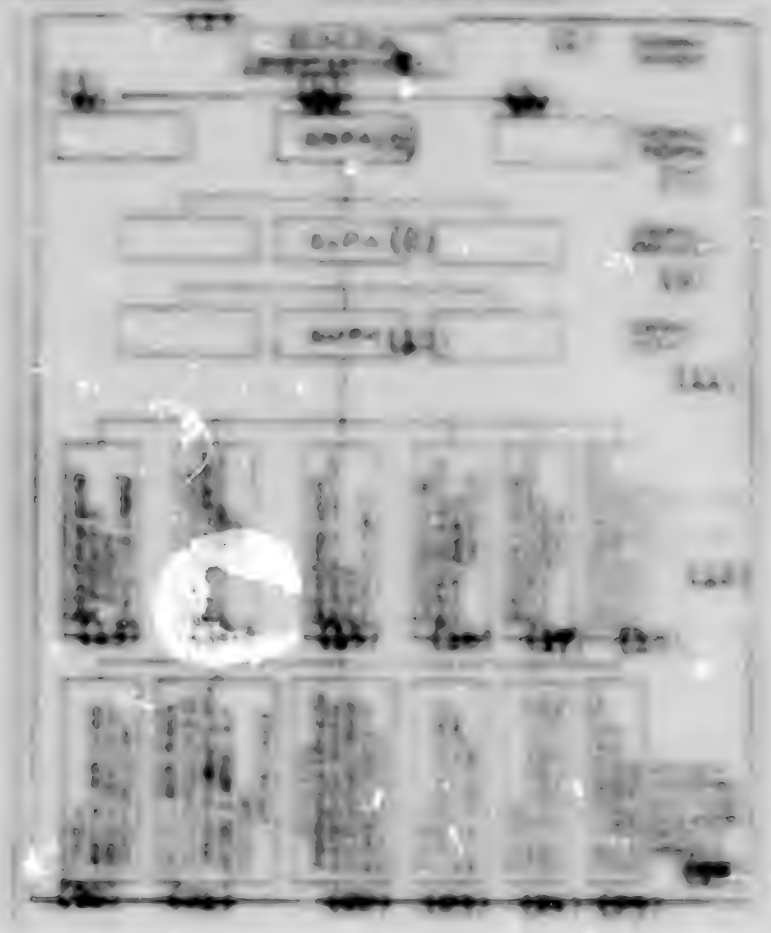
Key: 1. National System for Protection and Alerting
2. National Council for Protection of the Environment
3. Novosti Chemical Combine
4. Khimik Chemical Combine
5. Severnyi Synthetic Fibers Combine
6. Rayon Chemical Fertilizer Combine
7. Rayon Chemical Combine

It is obvious that at the USSR system level, we must have application of a corresponding system strategy which will be able to counteract the destructive effects of pollution. This will, therefore require adoption of a strategy for environmental protection which will take into consideration the correlations at the microecological, macroecological and world ecological level.

However, in order for it to be possible to implement measures for prevention of pollution cases, it is first necessary to have a good scientific information base. It is widely accepted at present that the damage which can be caused by pollution justifies the material and financial efforts for scientific documentation by means of experimentation and simulation of records by means of electronic data processing. It is also widely accepted that in order to achieve the highest possible effectiveness there will

[illegible] to the [illegible] of accident [illegible] [illegible] specialists in [illegible] different [illegible] tasks as timing, [illegible], data processing, etc. so as to have a multi-disciplinary approach to [illegible] [illegible].

Figure 2. Structure of the [illegible] and alerting system



Key: 1. [illegible] Protection and Alerting System (Program Activities)
2. [illegible] System
3. [illegible] Federated Socialist Republic
4. [illegible] Socialist Republic
5. [illegible] People's Republic
6. [illegible] Protection and Alerting System
7. [illegible] System
8. [illegible] Protection and Alerting System
9. [illegible] System (County)
10. Plant Protection and Alerting System
11. Plant System
12. Subsystems of the Plant System
13. Plant Subsystem for Protection and Alerting [illegible] the Human Risk

16. Plant Subsystem for Protection and Alerting Concerning Plant Transportation
17. Plant Subsystem for Protection and Alerting Concerning the Generation of Noxious Agents
18. Plant Subsystem for Protection and Alerting Concerning Radioactive Pollution
19. Plant Subsystem for Protection and Alerting Concerning Sound Pollution
20. Instrument Panel of Activities Involving Protection and Alerting/Plant System for Protection and Alerting
21. Applications of the Protection and Alerting subsystem for the Generation of Noxious Agents
22. Application -- Dangerous Materials (Explosives, Chemicals, Radioactive Substances)
23. Application -- Changes in Production Installations and Determination of Associations Through Operations Research Methods and Models
24. [illegible] -- Proliferation and Concentration of Entomological Factors with Pollutant Factors Emanated, Their Effect on the Environment
25. Application -- Hydrometeorological Conditions (Off-line/In-line On-line/Realtime)
26. Application -- Deposits on the Ground and the Real Forecasting Expected from People in the Area
27. Instrument Board of Activities Involving the Protection and Alerting for Noxious Agents

Such an experiment took place between the Piatra Neamt Territorial Center for Electronic Computers and the Stejarul Biological Research Station in Pingarati. The purpose of this experiment was to develop an automatic data processing system for studying the interaction between climatic factors and pollutant factors -- the influence of these on the environment. The direct beneficiary of the research topic was a representative unit of the chemical industry, the Borzesti Chemical Combine, which was considered as having had successful experience in this field. The conclusion which was reached was that it was necessary to act efficiently first of all at the industrial unit level in accordance with internal regulations and then at the central level, in accordance with international norms and recommendations, as well as in accordance with the situations which existed in the territory. Recommendations and information on international norms are to be developed by Project Eurisotop, a project financed by the EC which will provide data obtained by satellite in respect to parameters established and which will form the audit system for protection and alerting -- the [illegible] (Sistemul auxiliar de protectie si alertare). The data will be received in each national system with appropriate technical equipment, which, together with other equipment and technologies for processing and transmitting, make up the national system for protection and alerting -- the [illegible] (Sistemul national de protectie si alertare). As an organizational form, the [illegible] can be the National Council for Protection of the Environment -- the [illegible] (Consiliul National pentru Protectia Mediului Inconjurator). The [illegible], which is equipped with a high capacity computer,

[illegible] become the central element of the system. The national system, in turn, would have subordinate to it a number of [illegible] systems which were within a limited territory and which have subordinate to them many plant, agricultural, research and other systems of the greatest operational importance. There in turn would have subordinate to them subsystems and definite applications dependent on the type of unit. Within such a scheme, the subsystems of the plant system could be those concerning the [illegible] plant transportation, emission of noxious agents, radioactive pollution, ozone production, the instrument board of protection and alerting activities. Particular the details, the plant subsystem for protection and alerting concerning the emission of noxious agents could contain the following applications: dangerous materials (explosives, combustible, radioactive substances) etc.; damages in productive installations and determination of the emission of noxious agents through operation; research methods and models, the proliferation and interaction of meteorological factors with pollutant factors emission and their effect on the environment, hydrometeorological conditions, deposits on the ground, the instrument board of noxious agent protection and alerting activities. The functionality of the system must be ultimately secured through the intermediary of units [illegible] for analysis, measurement and transmission in both directions.

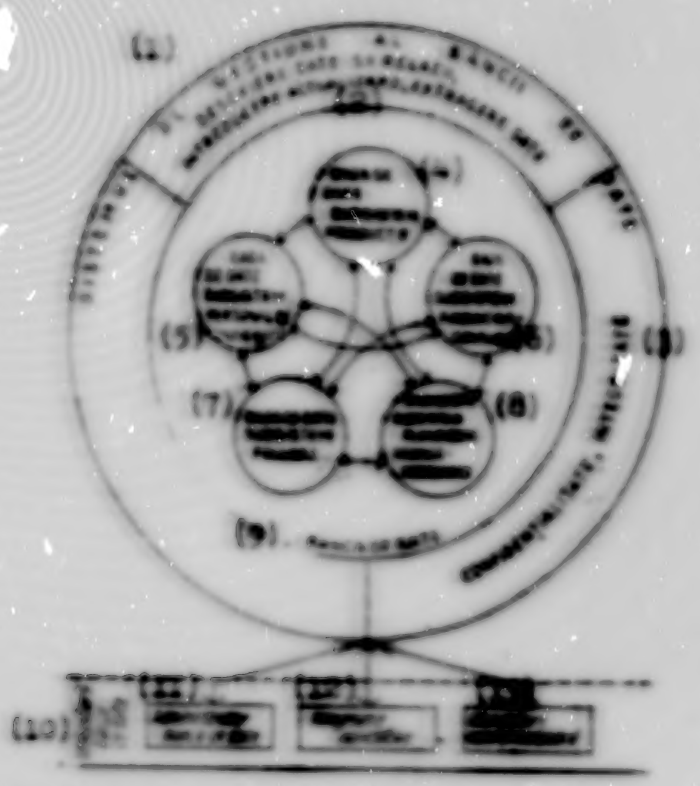
In this way, the [illegible] will receive a series of information from the world system ([illegible]) and another series of information from the local systems (concerning the emission of noxious agents etc.). The local system will have a series of meteorological information for the entire county area which it can analyze in correlation with data (noxious agents) received from the plant systems, which would have all the information concerning pollution at the economic unit level and, implicitly, the possibility for local control and prevention through the apparatus for rapid intervention and control.

The transmission of data, information and decisions from and to the system and from one system to another can be handled initially by the traditional means, with the goal of later having an operational network of computers on a national basis -- the [illegible] (Between nationals in network are [illegible] a translation system is partially shown in Figure).

The [illegible] plant system, organized at the plant, combine or research center level, should have its own data base which, through integration with the data base of the objective, becomes a subsystem in terms of structure and data base -- specific to the problems of pollution -- a logical component of the data base. Functioning in close correlation with the other subsystems within the framework of the information system. The completion of the data base specific to pollution processes -- [illegible] -- with the research-development subsystem is realized through the intermediary of components in the data base, with this data base being consulted in the process of designing and planning new products, taking into consideration the consumption of fuel, the degree of pollution caused by the technological process and the degree of pollution caused by the resultant

product. The connection with the production subsystem is to be achieved through the intermediary of the components known as CAPACITIES, ARTICLES, CURRENCIES and TECHNOLOGIES, including the decisions regarding the technological process. The connection with the personnel-remuneration subsystem is to be realized through the intermediary of the PERSONNEL component in respect to the physical-chemical and biological analyses of the personnel who are carrying out activity in the production sections, as well as the personnel in the zone. The connection with the finance-accounting subsystem is realized through the intermediary of the components referred to as ARTICLES, STOCKS and PENALTIES relative to failure to respect the norms for protection of the environment. Use of the Leontieff model in pollution problems greatly simplifies all activity relative to simulation of some of the multiple variants so that the optimum variant concerning the combination of antismog agents is discovered before the production process is started.

Figure 3. System for Management of the Data Base in the Plant System for Protection and Alerting (SUPA)



Key: 1. System for Management of the Data Base
2. Description of the data and relationships, introduction, correction, and extraction of data
3. Confidentiality, Integrity
4. Production subsystem data base
5. Personnel-remuneration subsystem data base

6. Finance-accounting subsystem data base
7. Pollution subsystem data base
8. Technical-economic planning subsystem data base
9. Data base
10. Data base users
11. Data base administrator
12. Applications programs
13. Man-data processing users

Keeping in mind the process of rapid industrialization and the changeover to intensive technologies with high parameters, I believe that the measures for prevention of pollution through proper organization and technical endowment are fully justified. This is even more so because of the fact that the accidents caused in a number of industrialized countries have drawn very serious attention to studies on the importance of maintaining and preserving ecological balance both during the immediate period and in the perspective of a very long period of time. I believe that application of measures for protection of the environment within a systemic concept is in full accordance with and responds to the goals and spirit of the program directive for scientific research and technological development which was discussed and approved by the Twelfth Party Congress.

[illegible]
[illegible]: 2700 [illegible]

SELECTIVE LIST OF JPRS SERIAL REPORTS

EASTERN EUROPE SERIAL REPORTS

EAST EUROPE REPORT: Economic and Industrial Affairs
EAST EUROPE REPORT: Political, Sociological and Military Affairs
EAST EUROPE REPORT: Scientific Affairs

WORLDWIDE SERIAL REPORTS

WORLDWIDE REPORT: Environmental Quality
WORLDWIDE REPORT: Epidemiology
WORLDWIDE REPORT: Law of the Sea
WORLDWIDE REPORT: Nuclear Development and Proliferation
WORLDWIDE REPORT: Telecommunications Policy, Research and Development

END OF

FICHE

DATE FILMED

MARCH · 25 · 80

D.D.